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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/528,376	12/05/2005	Masamichi Morita	Q86778	6763
23373 7590 02/02/2010 SUGHRUE MION, PLLC 2100 PENNSYLVANIA AVENUE, N.W. SUITE 800 WASHINGTON, DC 20037				
EXAMINER HIGGINS, GERARD T				
ART UNIT		PAPER NUMBER		
1794				
NOTIFICATION DATE		DELIVERY MODE		
02/02/2010		ELECTRONIC		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

sughrue@sughrue.com  
PPROCESSING@SUGHRUE.COM  
USPTO@SUGHRUE.COM

### Office Action Summary

**Application No.**

10/528,376

**Applicant(s)**

MORITA ET AL.

**Examiner**

GERARD T. HIGGINS

**Art Unit**

1794

**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 21 October 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-5, 7-9 and 11-17 is/are pending in the application.
- 4a) Of the above claim(s) 7-9 and 11-14 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5 and 15-17 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB-06)
- 4) ☐ Interview Summary (PTO-413)
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_
- Paper No(s)/Mail Date \_\_\_\_\_

## **DETAILED ACTION**

### ***Response to Amendment***

1. The amendment filed 10/21/2009 has been entered. Currently claims 1-5, 7-9, and 11-17 are pending, claims 7-9 and 11-14 are withdrawn, and claims 6, 10, and 18 are cancelled.

### ***Claim Objections***

2. Claim 1 is objected to because of the following informalities:
  - a. On the fourteenth line of the claim the "A" at the beginning of the line is objected to grammatically because it should be a lower case "a."
  - b. In option "(d)" the phrase "a fluorine compound having a linking group" is objected to grammatically. This objection will be withdrawn if "having a linking group" is deleted.Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 1-5 and 15-17 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject

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matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

With regard to claim 1, the Examiner does not find support for the limitations of option "(c)" in the specification as originally filed. Specifically, the perfluoroalkyl group monomer claimed is a fluoroalkyl acrylate polymer and not a silane. The Examiner would find the limitations for the "polymer" in the silane at page 21, lines 20-22 to be supported.

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 1-5 and 15-17 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

With regard to claim 1, the variable 'p' for option "(c)" is not present in the equation that precedes it. The Examiner interprets the alkyl (CH<sub>2</sub>) adjacent the sulfur to have the subscript 'p.'

***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and

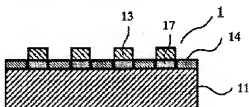
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the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1-5 and 15-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishida (JP 2002-023356), machine translation included, in view of Matsuo et al. (4,687,707).

With regard to claims 1 and 17, Ishida discloses a material useful for semiconductor devices, displays, LED's etc. [0002] and Figure 5.

【 図 5 】



The substrate 11 is the same type of materials as used by applicants [0013], and there is an alternating line pattern [0031] comprised of a 1<sup>st</sup> (14) and 2<sup>nd</sup> (17) self-organization organic thin films [0017] and [0018], respectively. The 1<sup>st</sup> self-organization film is comprised of fluoro alkyl silanes such as heptadecafluoro tetrahydro decyltrichlorosilane. A conductive material is then formed above the 2<sup>nd</sup> self-organizing film by use of a plating method [0033]. The device is anisotropic because the characteristics of the surface will differ in the direction of the alternating line pattern; however, Ishida does not disclose one of the fluorine-containing organic silane compounds of applicants' claims 1 and 17.

Matsuo et al. disclose "Low reflectance transparent material having antisoiling properties" (Title) that can be used on small size precision optical parts (col. 2, lines 10-

25). They suggest using perfluoroalkyl group-containing compounds such as silanes (col. 3, line 60 to col. 4, line 9). They recommend using a perfluoroalkylene group containing 2 to 12 carbon atoms and preferably 3 or more carbon atoms (col. 4, lines 10-20). They disclose heptadecafluoro tetrahydro decyltrichlorosilane (col. 4, lines 45-47) as being an equivalent for urethane containing linkages that read on option "(d)" (col. 5, line 38) and perfluoroisopropyl silanes that read on option "(a)" (col. 5, lines 30-33). Please note that the exemplary urethane compound may have a perfluoroalkyl group of 3 carbon atoms as suggested at col. 4, lines 10-20.

Since Ishida and Matsuo et al. are drawn to the same perfluoroalkyl silane compounds that are both used for antisoiling, i.e. liquid repellant, purposes; it would have been obvious to one having ordinary skill in the art at the time the invention was made to have merely substituted the heptadecafluoro tetrahydro decyltrichlorosilane of Ishida for any of the compounds of Matsuo et al. including the perfluoroisopropyl silanes disclosed. The results of such a substitution would have been obvious to one having ordinary skill in the art. The motivation to make the substitution is that all the compounds are known to have low reflectance and good antisoiling properties for optical articles; further, Matsuo et al. recognize that a larger number of carbon atoms in the perfluoroalkyl group is economically unfeasible (col. 4, lines 14-20).

With regard to claim 2, the Examiner deems that the surface free energy difference between the alternating line patterns on the device of Ishida in view of Matsuo et al. intrinsically comprises the values claimed. The Examiner deems this to be so because Ishida teaches at [0004] that it is known in the art that the functionality of

the alternating lines changes the surface characteristics of the alternating lines. Surface free energy is a "surface characteristic" as taught by Ishida; furthermore, since the materials of the alternating line pattern are the same as those claimed by applicants, they would intrinsically display the surface free energy difference claimed by applicants.

With regard to claim 3, Ishida teaches at [0031] that the width and pitch of the lines are 20 microns.

With regard to claim 4, Ishida teaches at [0015] that the self-organization layers of the present invention are excellent in forming "uniform films with a molecular level." A uniform film would necessarily have an unevenness of less than 10 nm, especially considering the organic films are on the order of 3 nm thick [0014].

With regard to claim 5, the Examiner deems that the device of Ishida would intrinsically comprise the testing conditions of applicants' claim 5. The Examiner has deems this to be so because the materials that comprise the alternating line pattern of Ishida in view of Matsuo et al. are the same as those claimed by applicants.

With regard to claim 15, Ishida et al. teach at [0014] and [0015] that a monomolecular film is formed. Both lines of the alternating-line pattern are made of a monomolecular film in order to result in the very thin nature of the organic molecular film, i.e. about 1 or 3 nm.

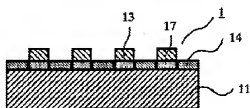
With regard to claim 16, Ishida teaches at [0035] that a conductive nickel film was plated onto the alternating line pattern to a thickness of 0.1 micron, which reads on the limitations of the claim.

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9. Claims 1-5 and 15-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishida (JP 2002-023356) in view of Katz et al. (EP 1041652) and Matsuo et al. (4,687,707).

With regard to claims 1 and 17, Ishida discloses a material useful for semiconductor devices, displays, LED's etc. [0002] and Figure 5.

【図5】



The substrate 11 is the same type of materials as used by applicants [0013], and there is an alternating line pattern [0031] comprised of a 1<sup>st</sup> (14) and 2<sup>nd</sup> (17) self-organization organic thin films [0017] and [0018], respectively. The 1<sup>st</sup> self-organization film is comprised of fluoro alkyl silanes such as heptadecafluoro tetrahydro decyltrichlorosilane. A conductive material is then formed above the 2<sup>nd</sup> self-organizing film by use of a plating method [0033]. The device is anisotropic because the characteristics of the surface will differ in the direction of the alternating line pattern; however, Ishida fails to teach the use of a layer of a semiconductor compound as the functional material or that one of the fluorine-containing organic silane compounds of applicants' claims 1 and 17.



Katz et al. teach using organic semiconductor materials as a functional material for fabricating circuitry (Abstract and [0022] to [0023]). These materials can be bound to fluorinated silane surfaces [0030] and [0031].

Since Ishida and Katz et al. are both drawn to patterning of substrates for circuit technology, it would have been obvious to one having ordinary skill in the art at the time the invention was made to substitute the organic semiconductor materials of Katz et al. as the functional material of Ishida. The results of which would have been entirely predictable to one having ordinary skill in the art of semiconductor manufacture. Specifically, one of ordinary skill would understand that the organic semiconductor material would bind to the 1<sup>st</sup> self-organizing material (fluoro alkyl silanes) instead of binding to the thiol or amino modified 2<sup>nd</sup> self-organizing material.

Matsuo et al. disclose "Low reflectance transparent material having antisoiling properties" (Title) that can be used on small size precision optical parts (col. 2, lines 10-25). They suggest using perfluoroalkyl group-containing compounds such as silanes (col. 3, line 60 to col. 4, line 9). They recommend using a perfluoroalkylene group containing 2 to 12 carbon atoms and preferably 3 or more carbon atoms (col. 4, lines 10-20). They disclose heptaecafluoro tetrahydro decyltrichlorosilane (col. 4, lines 45-47) as being an equivalent for urethane containing linkages that read on option "(d)" (col. 5, line 38) and perfluoroisopropyl silanes that read on option "(a)" (col. 5, lines 30-33). Please note that the exemplary urethane compound may have a perfluoroalkyl group of 3 carbon atoms as suggested at col. 4, lines 10-20.

Since Ishida and Matsuo et al. are drawn to the same perfluoroalkyl silane compounds that are both used for antisoiling, i.e. liquid repellant, purposes; it would have been obvious to one having ordinary skill in the art at the time the invention was made to have merely substituted the heptadecafluoro tetrahydro decyltrichlorosilane of Ishida for any of the compounds of Matsuo et al. including the perfluoroisopropyl silanes disclosed. The results of such a substitution would have been obvious to one having ordinary skill in the art. The motivation to make the substitution is that all the compounds are known to have low reflectance and good antisoiling properties for optical articles; further, Matsuo et al. recognize that a larger number of carbon atoms in the perfluoroalkyl group is economically unfeasible (col. 4, lines 14-20).

With regard to claim 2, the Examiner deems that the surface free energy difference between the alternating line patterns on the device of Ishida in view of Katz et al. and Matsuo et al. intrinsically comprises the values claimed. The Examiner deems this to be so because Ishida teaches at [0004] that it is known in the art to vary the functionality of the alternating lines to thereby change the surface characteristics of the alternating lines. Surface free energy is a "surface characteristic" as taught by Ishida; furthermore, since the materials of the alternating line pattern are the same as those claimed by applicants, they would intrinsically display the surface free energy difference claimed by applicants.

With regard to claim 3, Ishida teaches at [0031] that the width and pitch of the lines are 20 microns.

With regard to claim 4, Ishida teaches at [0015] that the self-organization layers of the present invention are excellent in forming “uniform films with a molecular level.” A uniform film would necessarily have an unevenness of less than 10 nm, especially considering the organic films are on the order of 3 nm thick [0014].

With regard to claim 5, the Examiner deems that the device of Ishida would intrinsically comprise the testing conditions of applicants' claim 5. The Examiner deems this to be so because the materials that comprise the alternating line pattern of Ishida are the same as those claimed by applicants.

With regard to claim 15, Ishida et al. teach at [0014] and [0015] that a monomolecular film is formed. Both lines of the alternating-line pattern are made of a monomolecular film in order to result in the very thin nature of the organic molecular film, i.e. about 1 or 3 nm.

With regard to claim 16, Ishida teaches at [0035] that a conductive nickel film was plated onto the alternating line pattern to a thickness of 0.1 micron, which reads on the limitations of the claim.

### ***Response to Arguments***

10. Applicant's arguments, see Remarks, filed 10/21/2009, with respect to the rejection of claim 18 under 35 U.S.C. 112, first paragraph and the rejection of claim 18 under 35 U.S.C. 112, second paragraph have been fully considered and are persuasive. The rejections have been withdrawn.

With regard to the nomenclature of compound (a) in claim 1, the Examiner agrees that the specification broadly supports the usage of Rf because the concept the branched fluoroalkyl group having 3 to 5 carbon atoms is supported at page 17, lines 2-5 and the Rf is seen in the other embodiments for the perfluoroalkyl group.

With regard to the 'D' group of option "(c)" in claim 1, the Examiner agrees that the specification broadly supports the formula at page 21, lines 22-25.

With regard to the 'Z' group of option "(d)" in claim 1, the Examiner agrees that the specification broadly supports the formula at page 22, line 8 to page 23, line 10.

11. Applicant's arguments, see Remarks, filed 10/21/2009, with respect to the rejection(s) of claim(s) 1-5 and 15-17 with the cited prior art have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of the Matsuo et al. reference (4,687,707).

Applicants' amendment has narrowed the claim scope such that the previous rejection under 35 U.S.C. 102(b) of claim 1 no longer applies; furthermore, applicants' were correct in noting, as the Examiner also confirmed with the translations branch at the USPTO, that Ishida (JP 2001-284289) does not disclose a perfluoroisopropyl group as was used to reject previous claims 17 and 18.

The present rejection is based upon substitutional equivalents known to have the same uses. The Examiner deems it would have been obvious to have substituted the

perfluoroalkyl group-containing compounds of Ishida with the perfluoroalkyl group containing compounds of Matsuo et al.

The declaration under 37 CFR 1.132 filed 06/03/2009 is insufficient to overcome the rejection of claims 1-5 and 15-17 based upon the cited as set forth in the last Office action because it is not commensurate in scope with the claimed invention because it does not show results over the entirety of the claimed invention; furthermore, there is no example of a compound that reads on the option (c) as now claimed.

### ***Conclusion***

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to GERARD T. HIGGINS whose telephone number is (571)270-3467. The examiner can normally be reached on M-Th 10am-8pm est. (Friday off).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Ruthkosky can be reached on 571-272-1291. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Mark Ruthkosky/  
Supervisory Patent Examiner, Art Unit 1794

GERARD T. HIGGINS  
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